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(54) Protective undergarment for retention of body fluids.

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**Description**

The present invention relates to a garment to be worn on the lower part of the body for the retention of body fluids, said garment comprising a body portion and a crotch portion, said body portion having a waist opening, and said body portion and crotch portion forming leg openings.

**BACKGROUND OF THE PRESENT INVENTION**

Incontinence is a condition of particularly sensitive nature, but should not be a debilitating one. Using a hypothetically perfect optimal garment, the incontinent individual should be able to function normally, comfortably and without constant worry about embarrassing leakage of urine. Garments currently on the market which attempt to solve this problem lack some crucial aspect of comfort-retention balance, namely, they do not afford optimal liquid-retention and comfort to the wearer.

The comfort of the optimal incontinent undergarment includes four aspects: good fit, elasticity, breathability and discreetness. A well-fitting elastic undergarment will stretch adequately to accommodate to the wearer comfortably, yet it clings to the skin sufficiently to maintain fluid retention. Elasticity makes movement easier and more comfortable to the wearer, as well as minimizing garment shifting during significant movement. Breathability indicates a water vapor transmitting garment enabling the user's body moisture to escape (but at the same time affording protection against escape of liquid if the garment is liquid-proof), as well as promoting hygiene by keeping the crotch area dry. Discreetness is assured by the softness and drape which renders it silent as opposed to a plastic diaper or non-woven paper diaper which is audible when the user moves. Further, in this regard, the nearer the garment appears outwardly to be an ordinary undergarment (i.e., a woman's elastic brief or panties, for example), the more appealing and discreet the garment is.

The retentive aspect of the optimal incontinent undergarment includes: snugness, liquid penetration-resistance, and adaptability to use with an absorbent crotch pad or pads. Because prior garments of this type were not well fitting, they were not well adapted for use with the related purpose as a retainer of absorbent pads for women's menstrual flow.

**PRIOR ART**

Garments on the market typically have one or two of the above features, however, there are none having all of the features required for an optimum protective garment. For instance, a sanitary panty garment described in US-A-3 613 685 has a crotch section formed from a laminate composed of an inner layer of flexible stretchable plastic foam and an outer layer of stretchable synthetic fabric. Such laminate material is lacking the important feature of breathability. On the other hand, there is another material, well-known under the tradename "Gore-Tex", which is generally considered liquid-proof and moisture-penetrable. However, fabrics of this type offer a marginal amount of elasticity only and therefore are not suitable to be incorporated into protective undergarments.

It is accordingly a principal object of the present invention to provide an undergarment to be worn on the lower body for retention of body fluids which is comfortable, well fitting and discreet.

It is also an object of the present invention to provide such an undergarment for retention of body fluids which is liquid-proof, elastic and breathable.

It is another object of the present invention to provide an undergarment for retention of body fluids which is snug, liquid-resistant or liquid-proof and adapted to be used with an absorbent crotch shield.

It is a further object of the present invention to provide an undergarment for retention of body fluids which is durable and does not have a tendency to deteriorate during ordinary use, including machine washing and drying.

It is yet another object of the present invention to provide an undergarment which will accept disposable absorbent shields for women's menstrual flow.

It is to be understood that the terms "stretch" and "elastic" are used interchangeably in this specification.

**SUMMARY OF THE INVENTION**

In accordance with the invention, a garment of the type indicated above is characterized by means disposed at least in the crotch portion, for the retention of body fluids, said means including a laminated fabric, and said fabric including a liquid-proof, breathable stretch thermoplastic film layer and a breathable elastic fiber-containing material layer. Preferably the film layer is disposed inside the garment when the garment is worn.

For better understanding of the present invention, reference is made to the following description and accom-

panying drawings, while the scope of the present invention will be pointed out in the appended claims.

## BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

Figure 1 represents a frontal view of a undergarment in accordance with the invention;

Figure 2 illustrates an absorptive pad for use with the undergarment of Fig. 1;

Figure 3 illustrates a side sectional view taken along 3-3 of Fig. 1; and

Figure 4 represents a plan view of the crotch portion of the undergarment shown in Fig. 1.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring initially to Fig. 1, an undergarment is shown there, 10, with a body portion 11 and a crotch portion 12. The body portion 11 is preferably a spandex fiber-containing stretch fabric, typically knitted, while the crotch portion 12 is composed of a laminate having a fabric similar to the stretch fabric of the body portion 11 on the outside of the crotch area, while a thermoplastic stretch film 16 is disposed in the crotch area on the inside of the garment.

The undergarment contains a waist portion 15 and leg portions 13 having elastic leg bands 14 for improving the liquid retention capabilities of the garment. The waist 15 also includes an elastic band as is typical in this garment.

The garment is designed to enhance both the liquid retention capabilities of the garment, as well as the overall attractiveness. It is specially designed and constructed to provide optimal service for use with an absorptive pad 20 as shown in Fig. 2. The key to the garment is the crotch portion 12. This is constructed especially as a laminate having an outer layer 17 made of a stretch fiber-containing material (preferably a knit material) which is bonded to a thermoplastic stretch film by a suitable adhesive. Such laminate is elastic, breathable and liquid resistant or liquid-proof. A suitable laminate is described in U.S. Patent No. 4 761 324, filed June 24, 1987, the disclosure of which is incorporated herein by reference. The laminate described in that application includes a layer of stretch material having substantial elastic qualities and a polymer film having a thickness less than 1.0 mil ( $2.54 \times 10^{-5}$ m). The film is breathable and water-resistant and has elastic qualities comparable to the stretch material. For the garment described herein, polyurethane film having an 0.8 mil ( $2.032 \times 10^{-5}$ m) thickness is preferred.

The pad is a standard absorptive pad, such as made by a company called ICD, under the brand name "SURETYS". The crotch area is designed to accommodate the size of the pad and to allow for the best retention/comfort qualities of the garment. Figure 3 illustrates the disposition of pad 20 in the crotch area of the garment 10 when worn.

The retention capabilities of the leg band, crotch and pad system depend on the use of a properly tensioned leg band. If the leg band is not snug enough, liquid retention will not be at an optimum level. If the band is too tight, discomfort will be caused to the wearer.

The making of the garment requires special attention in that fabrics of two different types are used in the crotch and body portions. Certain parts of the garment require shirring, particularly in the crotch area. Because of the unusual characteristics of the laminated fabric used in the crotch, special ballpoint needles must be used to prevent cutting of the laminate, maintain uniform stitch size and reduce thread breakage. The machines used in sewing the garment must be run at speeds substantially below that used in conventional manufacturing procedures.

Three different types of threads are used in the garment: (1) regular nylon thread for additional strength; (2) stretch nylon thread for stretchability as well as strength and softness; and (3) polyester thread for durability.

Further, all machine feeder plates and presser feeds must be specially Teflon® coated in order to join the laminated fabric of the crotch portion with the conventional nylon/spandex of the body portion.

In addition to providing the liquid retention capability to the crotch area, the film layer of the laminate also acts as a more secure place to fasten the underside of the shield, which ordinarily contains an adhesive strip (not shown). This prevents sliding of the shield when being worn.

In typical production, the garment is made in three sizes designated medium, large/extra large, and 2x/3x. The various preferred dimensions of these garments are as follows:

- (a) Leg openings: medium 20,3 cm (8 inches)  
large/extra large 21,6 cm (8 1/2 inches)  
2x/3x 22,9 cm (9 inches)
- (b) Side seam: medium 23,5 cm (9 1/4 inches)  
large/extra large 24,1 cm (9 1/2 inches)

(c) Waist:

2x/3x 26 cm (10 1/2 inches)  
 medium 28 cm (11 inches)  
 large/extra large 30,5 cm (12 inches)  
 2x/3x 33 cm (13 inches)

The crotch is usually the same for all three sizes. From front to back, designated "D" in Fig. 4, the preferred dimension is 28,6 cm (11 1/4 inches); the center part, designated "C" in Fig. 4, has a preferred dimension of 14 cm (5 1/2 inches); the point to point dimension on the garment, designated "A" in Fig. 4, is preferably 22,2 cm (8 3/4 inches); for the back of the crotch, designated "B" in Fig. 4, the dimension is 25,4 cm (10 1/4 inches).

The garment may be constructed in various ways without departing from the invention. For example, the crotch area may be constructed with a flap which is secured by Velcro brand strips. While the variation may be inappropriate for a ladies garment, since it may detract from the overall sleekness of the garment, it may be particularly useful in a male undergarment of this type.

While the garment is primarily intended as an incontinent garment, as has already been mentioned, it may be used with an appropriate absorbent pad for women having their menstrual flow.

Again, while the garment has been designed for incontinent persons or typically older people, it may also be worn by children who are bed wetters or have difficulty retaining their urine.

While the foregoing description and drawings represent the preferred embodiments of the present invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the scope of the present.

## Claims

1. A garment (10) to be worn on the lower part of the body for the retention of body fluids, said garment comprising a body portion (11) and a crotch portion (12), said body portion having a waist opening and said body portion (11) and crotch portion (12) forming leg openings, characterised by means (16, 17), disposed at least in said crotch portion (12), for the retention of body fluids, said means including a laminated fabric, and said fabric including a liquid-proof, breathable stretch thermoplastic film layer (16) and a breathable elastic fiber-containing material layer (17).

2. A garment according to claim 1, characterised in that said elastic fiber-containing material layer (17) is a knitted construction.

3. A garment according to claim 1, characterised in that said film layer (16) is disposed inside the garment (10) when the garment is worn.

4. A garment according to claim 1, characterised in that it includes disposable shield means (20) inserted in the area of said crotch portion (12), for absorption of body fluids.

5. A garment according to claim 1, characterised in that it includes elastic bands (14) disposed along said leg openings for securing said leg openings against a leg when the garment (10) is worn in order to prevent leakage of body fluids through said leg openings.

6. A garment according to claim 1, characterised in that said body portion (11) is an elastic fabric of knitted construction.

## Patentansprüche

1. Auf dem Unterleib zu tragendes Kleidungsstück (10) zum Zurückhalten von Körperflüssigkeiten, mit einem Hüftteil (11) und einem Schritteil (12), wobei der Hüftteil eine Bundöffnung aufweist, und der Hüftteil (11) und der Schritteil (12) Beinöffnungen bilden, gekennzeichnet durch mindestens im genannten Schritteil (12) vorhandene, einen laminierten Faserstoff umfassende Körperflüssigkeits-Rückhaltemittel (16, 17), welcher Faserstoff eine flüssigkeitsdichte, atmende und dehnbare, thermoplastische Folienschicht (16) und eine atmende, elastische, faserhaltige Materialschicht (17) aufweist.

2. Kleidungsstück nach Anspruch 1, dadurch gekennzeichnet, dass die genannte elastische, faserhaltige Materialschicht (17) eine gestrickte oder gewirkte Struktur aufweist.

3. Kleidungsstück nach Anspruch 1, dadurch gekennzeichnet, dass die genannte Folienschicht (16) sich beim Tragen des Kleidungsstückes (10) auf dessen Innenseite befindet.

4. Kleidungsstück nach Anspruch 1, dadurch gekennzeichnet, dass es im Bereich des Schritteils (12) eingefügte Auffangmittel (20) zur Absorption von Körperflüssigkeiten.

5. Kleidungsstück nach Anspruch 1, dadurch gekennzeichnet, dass es entlang den Beinöffnungen angeordnete, elastische Bänder (14) aufweist, welche beim Tragen des Kleidungsstückes (10) die Beinöffnungen

an den Beinen anliegen lassen, um das Ausfließen von Körperflüssigkeiten durch die Beinöffnungen zu verhindern.

6. Kleidungsstück nach Anspruch 1, dadurch gekennzeichnet, dass der Hüftteil (11) ein elastischer Stoff von gestrickter oder gewirkter Struktur ist.

## Revendications

1. Article de vêtement (10) destiné à être porté sur la partie inférieure du corps afin de retenir des fluides corporels, cet article de vêtement comprenant une partie de corps (11) et une partie d'entrejambe (12), la partie de corps présentant une ouverture de taille, tandis que la partie de corps (11) et la partie d'entrejambe (12) forment des ouvertures de jambe, caractérisé par des moyens (16, 17) disposés au moins dans la partie d'entrejambe (12) et servant à la retenue de fluides corporels, ces moyens comprenant un tissu stratifié et ce tissu comportant une couche (16) de film thermoplastique extensible, aéré et imperméable aux liquides et une couche (17) de matière contenant des fibres, élastique et aérée.

2. Article de vêtement suivant la revendication 1, caractérisé en ce que la couche (17) de matière contenant des fibres et élastique est de structure tricotée.

3. Article de vêtement suivant la revendication 1, caractérisé en ce que la couche (16) de film est disposée à l'intérieur de l'article de vêtement (10) lorsque cet article de vêtement est porté.

4. Article de vêtement suivant la revendication 1, caractérisé en ce qu'il comprend des moyens (20) formant protection et jetables, insérés dans la zone de la partie d'entrejambe (12), en vue de l'absorption de fluides corporels.

5. Article de vêtement suivant la revendication 1, caractérisé en ce qu'il comprend des liens élastiques (14) disposés le long des ouvertures de jambe afin de maintenir ces dernières en appui sur une jambe lorsque l'article de vêtement (10) est porté, en vue de prévenir une fuite de fluides corporels par ces ouvertures de jambe.

6. Article de vêtement suivant la revendication 1, caractérisé en ce que la partie de corps (11) est un tissu élastique de structure tricotée.

